

New and little-known South African Rhagionidae (Diptera).

by

B. R. STUCKENBERG.

(Natal Museum, Pietermaritzburg)

The Rhagionid genus *Atherix* is of peculiar interest on account of the gregarious habits exhibited by some of its species. Bequaert (1921) gives a summary of observations relating to the European *Atherix ibis* (Fabr.) and the North American *Atherix variegata* Walker. The adults of both these species are known to gather in dense, pear-shaped clusters on the ends of branches overhanging water where they oviposit and die. Enormous masses composed of eggs and dead flies may accumulate, new comers settling on the mass and ovipositing among the flies already dead. Aldrich (1912) describes how Californian Indians collect such masses of these flies which they prepare for food. Britton (1936) describes the discovery of large masses of eggs and the remains of many specimens of *Atherix variegata* on the underside of a bridge in Connecticut. The largest of these masses covered an area of approximately fifty square feet and was at least $\frac{1}{2}$ inch in depth. Hitherto the only recorded observation of gregarious behaviour in South African Rhagionidae has been that quoted by Bequaert (*loc. cit.*) which relates to *Atherix braunsi*, a species described by him as new. That species was collected by Dr. H. Brauns at Stellenbosch, Western Cape Province, where the fly was found "bunched together in masses as large as a man's head" on stones that emerge above the water in swiftly running streams. Bezzi (1926) made *Atherix braunsi* the type species of a new genus, *Pachybates*, which is still monotypic.

The discovery of another gregarious Rhagionid in South Africa, described below as representing a new genus and species, is of particular interest. This remarkable species was found by Mr. P. Graham and Mr. C. B. Cottrell, both of Rhodes University, who kindly donated the type material. The fly was observed clustering on the underside of a low-level bridge crossing the Groot Rivier near Plettenberg Bay in the Eastern Cape Province. Dense, irregular masses that resembled swarms of bees and which contained many dead females and batches of eggs, were stuck to the underside of the bridge. Live flies of both sexes, many of which were *in copula*, were moving over these masses in large numbers, and some were found floating in the stream below.

Trichacantha gen. nov.

Related to *Pachybates* Bezzi, 1926.

Eyes very widely separated in both sexes. Third antennal segment reniform with a dorsal arista. Strong, spine-like bristles present on upper part of occiput, angles of genae, palpi, mesonotum, and scutellum. Fore femora swollen, with a glabrous, shining area below. Tibial spurs completely lacking except on hind legs of male where a single exceedingly large and apparently movable spur is present; this spur probably operates in conjunction with the first tarsal segment to form a clasping organ. Wings with the anal cell broadly open; five posterior cells present; second vein ending at an acute angle in the first vein before the junction of the latter with the costa; marginal cell small, subtriangular, not enclosing a definite stigma; costal cell broadened along its entire length, the leading margin of the wing with a "shoulder" — this is best developed in the male. Hypopygium large, similar to that of *Pachybates braunsi* (Bequaert).

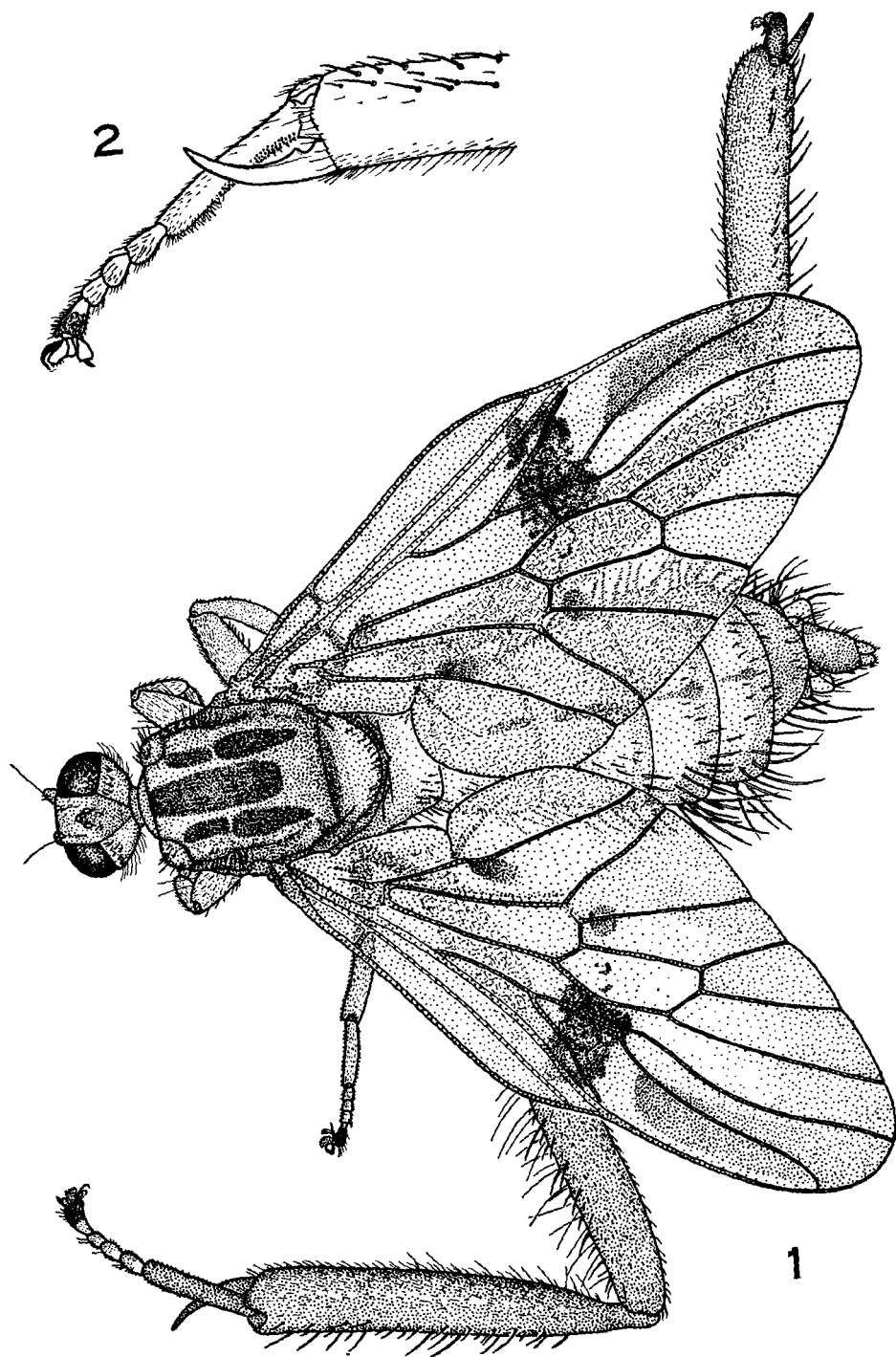
Type species — *Trichacantha atranupta* sp. n.

This genus is most closely related to *Pachybates* which it resembles in the following features: 1) the widely separated condition of the eyes in both sexes; 2) the presence of a shining, glabrous area on the under-surface of the fore femora; 3) the very broad wings; 4) the swollen front femora and enlarged hind coxae in both sexes, and the enlargement of the hind legs in the male; 5) the enlarged and pendulous hypopygium. It differs from *Pachybates* as follows: 1) the head and thorax have many strong bristles; 2) tibial spurs are lacking except on the hind legs of the male; 3) the anal cell is broadly open; 4) the marginal cell is reduced and subtriangular, ends in the first radial vein, and does not contain a stigma; 5) the costal cell is broadened, particularly in the male; 6) the abdomen of the male is long and subpedunculate, which six visible segments. *Trichacantha* differs from other genera of Rhagionidae in the absence of tibial spurs in the female and presence of only a single spur on the hind leg of the male.

Trichacantha atranupta sp.n. Text-figs. 1-4.

A species showing extreme sexual dimorphism. The male (fig. 1) is a robust, yellowish-orange fly with broad, yellowish wings and a long, drooping abdomen. The hind legs are enormously large in relation to the body and have a very large tibial spur. Strong, black bristles are present on the abdominal tergites and on the hind legs. The female is a much smaller and darker fly, superficially resembling an *Atherix*, but easily distinguished by the lack of tibial spurs, the features of wing venation mentioned in the generic diagnosis, and the peculiar spine-like bristles of the head and mesonotum.

Figs. 1—2. *Trichacantha atranupta* gen. et. sp. n. (1) Dorsal view of holotype ♂. (2) Hind tarsus and apex of hind tibia of ♂, in lateral view.

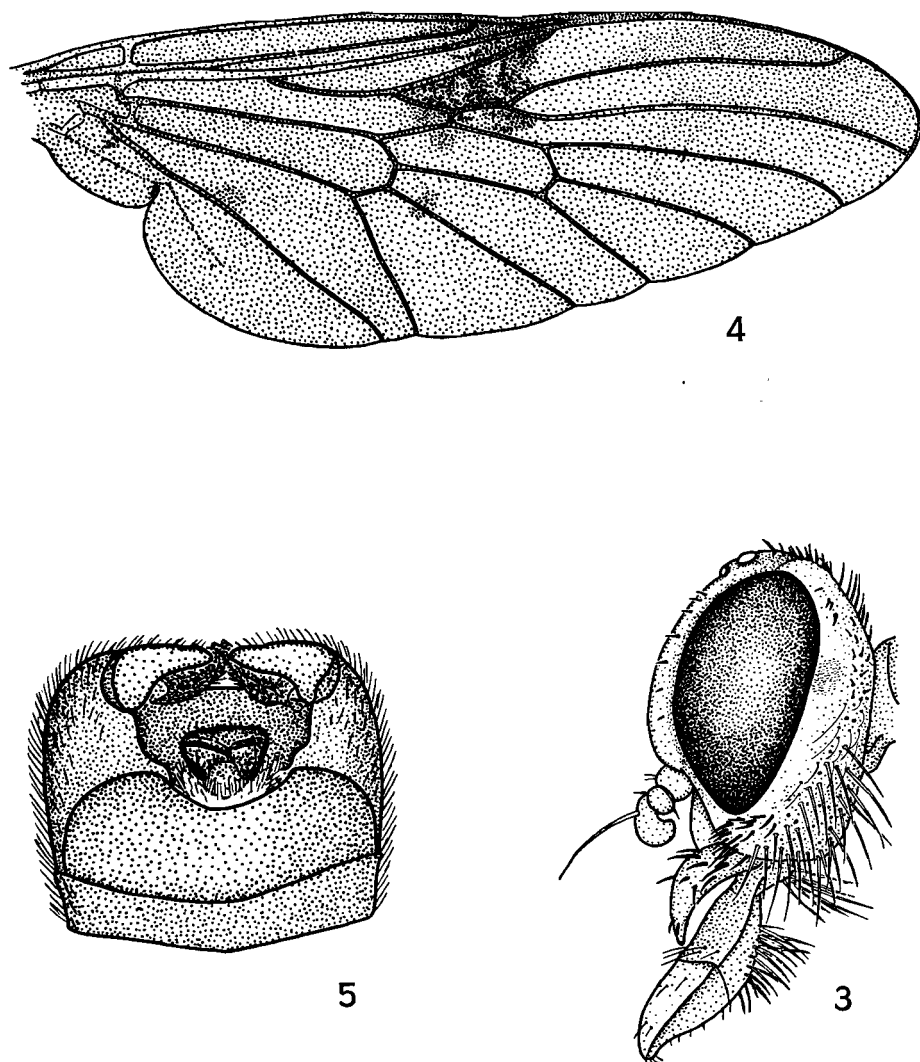


Male. (Fig. 1). Length 10 mm.; wing 9 mm.

Head (fig. 3) shaped very much as in *Pachybates* and *Atherix*, its longest axis nearly vertical. Occiput convex; transverse diameter of head a little less than width of thorax. Eyes very widely separated; inner orbits nearly parallel, only slightly divergent below. Frons about as wide as $\frac{1}{3}$ of transverse diameter of head. Face very short and strongly receding; antennae inserted on the lowest quarter of the head; a deep slit-like depression present below each antenna, the face strongly rounded between these depressions. Posterior orbits broad, gradually narrowed towards the vertex. Ocelli arranged in an equilateral triangle on a slightly raised tubercle that is prolonged onto the occiput and is widely separated from the inner orbits; each ocellus narrowly bordered with black. Proboscis slightly shorter than vertical diameter of head with well developed labella. Palpi $\frac{1}{2}$ length of proboscis, thick basally but sharply pointed apically, bent outwards over the apical half. Antennae small, the third segment reniform with a thin, dark brown, dorsal arista. Eyes bare, with the longest axis nearly vertical, and with facets of a uniform size. Head generally yellowish-orange, slightly brownish on the frons and vertex. Occiput with a very fine, silvery pruinescence; this is also present, but less noticeably so, on the frons and face. An obscure grey spot adjoins the posterior margin of each eye.

Thorax and scutellum of the usual shape, yellow-orange in colour, becoming darker on the dorsum and basal third of the scutellum. Mesonotum with three longitudinal, fuscous stripes as shown in fig. 1; each outer stripe is interrupted at the suture. Fore and middle legs of normal proportions, the femora (especially of the fore legs) dilated; basal half of undersurface of anterior femora glabrous and shining (a similar, better defined area is present on the femora in *Pachybates*).

Fore and middle tibiae much narrower than femora, without spurs; fore coxae distinctly longer than broad, middle coxae slightly longer than broad. Hind legs enormous in relation to the body; combined lengths of femur and tibia greater than length of body including head. Hind coxae exceedingly large and broad, elliptical in cross-section; hind trochanter twice as large as that of middle leg. Hind femora very stout throughout, of almost uniform diameter though thinned basally; slightly curved over the whole length. Hind tibiae narrowed basally but rapidly becoming exceedingly stout, even more so than the femora, and continuously increasing in diameter to the apex, the width at the apex a little greater than the width of the hypopygium. A single very large, stout, moderately curved tibial spur present (fig. 2); it is about $\frac{2}{3}$ of the length of the first tarsal segment, and longer than the greatest diameter of the tibia. Spur bluntly terminated and bearing a protuberance on its outer-surface near the base; the spur is apparently movable and appears to act in conjunction with the first tarsal segment to form a grasping organ. First segment of posterior tarsi a little longer than the remaining segments, bearing along its lower surface a strip of short, stout, black spicules which are more concentrated on the basal half. Fore middle legs coloured like the thorax; hind legs reddish-brown. Last tarsal segment black on a little more



Figs. 3—5. *Trichacantha atranupta* gen. et. sp. n. (3) Head of ♂. (4) Wing of ♀. *Lampromyia intermedia* sp. n. (5) dorsal view of hypopygium.

than the apical half on each leg. Fore and middle tarsi with the metatarsus subequal to all the other segments together; last segment equal to the two preceding segments; all the tarsal segments have a covering of very short, black bristles which are more concentrated along the inner surface.

Wings very broad, with five posterior cells, and with the anal cell broadly open. Costal cell very wide, wider than the marginal cell, tapering abruptly at the apex so that the costa is strongly reflexed to meet the almost straight subcosta. Costa intersecting first radial vein at an acute angle, then continuing in the direction indicated by that vein. As a result there is a prominent "shoulder" on the leading edge of the wing starting at the apex of the subcostal cell (see fig. 1). Subcostal cell also unusually broad. Second vein not twice as long as prefurca, irregular in shape and intersecting the first vein before the junction of the latter with the costa. Marginal cell not enclosing a definite stigma; it is subtriangular, short, broadest at the fork of the radial sector. Upper surface of first longitudinal vein with evenly-spaced, black setulae. Wing membrane with a general yellowish infusion, becoming almost amber in the anterior cells; with an extensive brownish infuscation in the marginal parts of the second submarginal and all the posterior cells. *M-Cu* cross-vein surrounded by a small thyridium. Conspicuous, irregular, dark-brown markings present together with a pronounced, broad, brownish infuscation in the first submarginal cell as shown in fig. 1.

Abdomen relatively large, drooping, as long as the thorax; it is subpedunculate, the constriction occurring between the first and second segments. Six segments are visible. First segment broadly attached to the thorax, its tergites divided down the median line, the one half overlapping the other slightly. Segments 2—5 increasing in width posteriorly, the tergites becoming progressively broader than long. The tergites overlap one another broadly and the anterior margin of each is distinctly narrower than the posterior edge of the preceding tergite; each is broader than its corresponding sternite. Tergite six smaller and irregular in shape. None of the tergites are strongly curved under laterally and all are noticeably flattened. Sternite seven projects prominently below the hypopygium. Hypopygium large, exposed, very like that of *Pachybates braunsi*, but with the cerci conspicuous from above as rounded lobes projecting posteriorly. Abdomen of the same colour as the sides of the thorax, the hypopygium more brownish. In the median line of each of tergites 2—5 there is an irregular, brownish mark.

The vestiture is of two types: a) stiff, erect, long, testaceous hairs; b) black bristles which are sometimes stout and spinelike. On the head the spine-like bristles are present as follows: on the upper part of the occiput behind each eye; on the lower angles of the genae, where they are strongly developed; on the palpi. Dorsal surface of second antennal segment with two bristles. There is a row of very small, black bristles on each side of the frons somewhat in from the inner orbits, and a row of similar though slightly longer bristles down the vertex behind each of the posterior ocelli. Stiff, testaceous hairs present on the remainder of the occiput, becoming progressively longer towards the oral margin, and similar longer hairs present on the under surface of the rostrum. Mesonotum without testaceous hairs, but with strong spine-like bristles, of which the longest are nearly half the width of the frons. These are distributed as follows: on the anterior part of the prescutum, the humeri, the notopleura where they are arranged in an irregular row and

radiate upwards and outwards, and on the scutellum. Small, black bristles are scattered irregularly over the dorsum, and somewhat longer bristles form irregular lines before the scutellum and above the bases of the wings. Pleura bare except for a sparse tuft of testaceous hairs on the propleuron and a few strong, black bristles and some testaceous hairs before the points of insertion of the halteres. Upper surface of hind femora with black bristles that are long basally but become progressively shorter apically where they are very small. Sides of femora with sparse, very small, black bristles. Ventral surface of femora with both short and long black bristles, the latter arranged in two irregular rows incorporating an almost glabrous strip on less than the apical half of the undersurface; in addition there are also many very long, stiff, erect, testaceous hairs also arranged in two irregular rows. The posterior tibiae have many small, depressed, black bristles, particularly on the ventral surface, and also many long, black bristles which are very strong on the upper surface where they form two irregular series. The sides of the abdominal tergites bear many very long, stiff, testaceous hairs that are directed outwards and slightly upwards and backwards. Black bristles of all sizes, none of which are very long, are present on the first tergite, and to a lesser extent on the succeeding tergites where those in the centre are very small and sparse. Sternites with soft, testaceous hairs, mainly along the posterior margin.

Female. Length 5.8 mm.; wing 6.6 mm.

Head similar to that of male. Occiput with silver-grey pruinescence. Mouthparts, frons and vertex dark brown, approaching "Mummy Brown" of Ridgway's "Colour Standards and Nomenclature". Frons with small, scattered, black bristles. Undersurface of head and rostrum with long hairs. Disc of mesonotum of same brown colour as frons, with indistinct, pale stripes along the dorsocentral lines and a darker stripe in the median line. Sides of mesonotum, scutellum, humeri and plurae tawny, the mesopleuron brownish. Vestiture of the thorax as in male, though the black bristles are not quite as numerous or as strong. All the legs normal, the tibial spurs completely lacking. Hind coxae large, shaped as in the male. Front femora somewhat swollen, with a shining, glabrous area below on the basal half; undersurface with long, pale hairs. Legs generally shining brown with the femoro-tibial joints pale, and the last tarsal segment dark over most of its length. Wings (fig. 4) large, with venation as in male. Costal and subcostal cells wide, but the leading edge of the wing with only a slight "shoulder", the costal cell tapering almost symmetrically to the apex and or almost uniform width throughout. Wing membrane smoky brown, the microtrichia dark, numerous and conspicuous. Veins tawny or dark brown, darker where adjoining markings on the membrane. Abdomen a little longer than the combined lengths of the head and thorax, roughly oval in shape, wider than the thorax, and flattened dorso-ventrally. Eight transverse tergites visible, of almost uniform width except for the last two. Abdomen dark, shining brown above, lighter brown below. No black spines or bristles present on abdomen; long, erect, pale hairs present along the lateral margins, and the sternites with numerous fine, pale hairs.

Type material. Holotype ♂, allotype ♀, Paratopotypes 4♂♂, 4♀♀ : Groot Rivier approx. 30 miles east Knysna, Eastern Cape Province, South Africa; 24.xi.1952; (*P. Graham, C. B. Cottrell*). Paratypes in collection of South African Institute for Medical Research, Johannesburg: 3♂♂, 1♀, Blauwkrantz Rivier, a few miles east Groot Rivier, Eastern Cape Province, South Africa; Jan. 1952: 1♀, Port Elizabeth, Eastern Cape Province, South Africa; Jan. 1952. The holotype and allotype have been deposited in the South African Museum, Cape Town. Paratypes have been donated to the British Museum (Nat. Hist.) and to the Musée Royal du Congo Belge, Tervuren.

The junction of the second vein with the first vein and not with the costa in *atranupta*, represents an advanced stage of a trend that is evident in several genera of Rhagionidae in which the second vein curves forwards at the apex around a stigma and unites with the costa at or a little before the end of the first vein. That condition is found in genera such as *Pachybates*, *Atrichops*, *Chrysopilus* and some species of *Atherix*. In *atranupta* the stigma has been eliminated by the further shortening of the second vein with corresponding reduction in size of the marginal cell. It is surprising that such a specialisation should be accompanied by so primitive a feature as the widely open anal cell.

***Pachybates braunsi* (Bequaert), 1921.**

Atherix braunsi. Bequaert, *Psyche*, 28, 3—6 (1921).

Pachybates braunsi. Bezzi, *Ann. S. African Mus.*, 23, 316—317 (1926).

I have five males and three females of this distinctive species. All were taken by Mr. A. Harrison on the Berg River, Upper Fransch Hoek Forest Reserve, Western Cape Province (C.S.I.R. No. GBG 739). The males agree with the original description except on the following points. Bequaert notes two tibial spurs on both the middle and hind pair of legs. In four of my specimens there is only a single spur on the middle tibiae; the fifth male has two spurs of which one is very small on the tibiae of the left middle leg. Bequaert states further that the thorax is a dull, dark brown. The two specimens on which his description is based were evidently rubbed, as is one of my specimens which has the thorax unicolorous dark brown. All the other specimens before me have the thorax and base of scutellum covered with dense grey dust. On the mesonotum there are three prominent, brown stripes; the middle stripe starts at the anterior margin of the mesonotum and ends half-way between the suture and the posterior margin; the lateral stripes start immediately behind the humeri and end a short distance before the scutellum, tapering posteriorly. There is some yellowish dust on the anterior part of the mesonotum on each side of and between the stripes. The extent of these stripes depends on the condition of the specimen. In worn specimens the dust is rubbed off in places and the stripes consequently merge in varying degrees.

The female of *braunsi* does not appear to have been described. Bequaert (*loc. cit.*) notes Brauns' observation that it was smaller and blacker than the male. The following description is based on the females in my possession.

Females. Of more or less the same size and general appearance as the male, but with a less brightly coloured, short, stout abdomen that is noticeably broader than the thorax, and with the legs not greatly swollen.

Frons wider than in the male, broadest below. Only the front femora swollen; these have the same glabrous, shining area on the undersurface that is present in the male and in both sexes of *Trichacantha atranupta*. Fore coxae long; middle and hind coxae short, stout and subequal. Fore and middle femora with some long, black hairs below. A single tibial spur present on the middle legs; two tibial spurs, one of which is reduced, on the hind legs. Middle and hind metatarsi projecting at the apex on the undersurface, though not nearly as much as in the male. Thorax coloured and marked as in the male. Wings proportionately larger than in the male, the venation identical. Abdomen squat, shorter than thorax to which it is broadly attached; with eight visible segments. First four segments forming the bulk of the abdomen, each strongly transverse; the succeeding four segments decrease rapidly in size posteriorly, the two apical segments very small and forming a pointed termination to the abdomen. General colour dull orange, with long, soft hairs as in the male.

Lampromyia intermedia sp.n. Text-fig. 5.

This species can be distinguished from the five described South African species of *Lampromyia* by the relative length of the proboscis which is twice as long as the vertical diameter of the head in the male and a little less than $1\frac{1}{2}$ times as long in the female. It is distinct from all the species except *brevirostris* Bezzi, in having the arista thickened. The most closely related species is *brevirostris* from which it may be distinguished by the length of the rostrum, darker coloration of the face, and the more heavily infuscated wings. The membranous area before the first abdominal segment is narrower than the first segment — in *brevirostris* it is broader.

Male. Length 10 mm.; wing 7.5 mm.

Face and frons dark brown, the former thinly covered with a shining brown tomentum, the latter with dense yellowish-brown tomentum that becomes paler along each orbit. Basal segment of antenna testaceous, twice as long as the second segment. Second and third segments dark brown, the third a little longer than the second and with a thickened terminal style that is hardly differentiated from the segment, the style and segment merging into an elongated, tapering unit. Style a little longer than the first segment. Ocellar tubercle black, shining, prolonged down the occiput as a slightly raised median ridge. Upper corner of each eye bordered by a subtriangular, black spot. Occiput very dark brown with yellowish-brown tomentum and with dark hairs that become longer and paler below. Palpi blackish, Proboscis blackish, the labrum with a testaceous margin; the proboscis is twice as long as the vertical diameter of the head.

Thorax mostly reddish-brown. Mesonotum with a blackish median stripe

that is very thin anteriorly but dilates suddenly just behind the suture; a pair of elongate, black spots are present on the anterior part of the mesonotum; there is a lateral spot adjoining the lateral margin of the mesonotum below and the transverse suture behind — this spot is continued behind the suture in a line bordering the lateral margin of the mesonotum, the two lines curving inwards and joining in the median line a short distance before the scutellum. Pleura translucent reddish-brown; mesopleuron, pteropleuron and metapleuron extensively fusco-piceous; the remaining sclerites have a covering of fine, silvery tomentum. Scutellum reddish-brown, with an obscure, black, median spot on the hind margin. Coxae fusco-piceous, with some pale hairs. Four anterior legs brownish, becoming darker over the last four tarsal segments. Hind femora yellowish at the base, mostly reddish-brown, blackish apically. Hind tibiae yellowish basally, otherwise blackish-brown. Hind tarsi mostly blackish, the metatarsi pale basally.

Wings smoky grey-brown, with conspicuous, dark microtrichia. Stigma dark brown. Tip of wing infuscated; apical part of first basal cell dark brown. Apex of second longitudinal vein angularly bent. Upper branch of fork of third vein nearly straight. Fourth posterior cell and anal cell open. Halteres with yellowish stalk and black knob.

Abdomen stalked, about $3\frac{1}{2}$ times as long as the thorax; the second, third and fourth segments narrow, elongated and subcylindrical. The sixth, seventh and eighth segments become progressively deeper and broader, the last two being more than twice as broad as deep. First segment dark brown admixed in places with black, with some dark hairs on the sides and a few fine pale hairs along the posterior margin. Second, third and fourth segments reddish-brown, their posterior margins edged with black; on each of these segments there is a black rectangular mark on each side of the median line. The black border of the fourth segment is continued anteriorly along the median line in a triangle, and the lateral margins are also bordered with black. The basal part of each of the second to fifth segments is tinged with yellow. The sixth, seventh and eighth segments are shining black, the sixth with some irregular yellowish-brown marks basally. Hypopygium (fig. 5) fusco-piceous above, reddish-brown below.

Female. Length 10.1 mm.; wing 8.1 mm.

As for the male, but with the following differences: rostrum a little less than $1\frac{1}{2}$ times as long as vertical diameter of head; labrum about $\frac{2}{3}$ as long as the rostrum. Fore and middle pairs of legs testaceous, the posterior pair dark reddish-brown. Wings not quite as dark as in male. The apex of the wing and the cells bordering the posterior margin are infuscated, with clear patches. The abdomen is not stalked, the tergites being comparatively broad and flattened. Second and third segments a little deeper than broad, with a slight constriction between them. Remaining segments broader than deep. First segment bordered with black on the sides. Lateral margins of second, third and fourth segments bordered with black over the posterior $\frac{2}{3}$ of their length. Hind margin of fourth segment and lateral and hind margins of fifth

and sixth segments bordered with black. Seventh and eighth segments black above, with a raised carina in the median line.

Type material. Holotype ♂, Allotype ♀, Paratopotype 1♂: Grahamstown, Eastern Cape Province, South Africa; dates of capture respectively — 7.xi.1953, 20.x.1953, 29.x.1953; (B. Stuckenberg). All the type material has been donated to the South African Museum, Cape Town.

Lampromyia brevirostris Bezzi, 1926.

Ann. S. African Mus., 23, 303—304 (1926).

This species does not seem to be well characterised. It was described on a male from Zululand and a reared "female" from an unknown locality. The "female" is a teneral specimen in very bad condition. The tip of the abdomen is missing and so the sex is uncertain, though the fly may not have been in that condition when Bezzi described it. It does not appear to me to be of the same species as the holotype male. The male lacks the third segment of each antenna. The rostrum of the "female" is twice as long as the vertical diameter of the head, while in the male it is of equal length.

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